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BIOLOGICAL BULLETIN

THE MARINE BIOLOGICAL LABORATORY

TWENTY-THIRD REPORT; FOR THE YEAR 1920.

TWENTY-THIRD YEAR.

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I. TRUSTEES

EX OFFICIO.

FRANK R. LILLIE, *Director*, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

D. BLAKELY HOAR, *Treasurer*, 161 Devonshire Street, Boston, Mass.

GARY N. CALKINS, *Clerk of the Corporation*, Columbia University.

TO SERVE UNTIL 1924.

H. H. DONALDSON, Wistar Institute of Anatomy and Biology.

CASWELL GRAVE, Washington University.

W. E. GARREY, Tulane University.

M. J. GREENMAN, Wistar Institute of Anatomy and Biology.

GEORGE LEFEVRE, University of Missouri, *Secretary of the Board*.

A. P. MATHEWS, The University of Cincinnati.

G. H. PARKER, Harvard University.

C. R. STOCKARD, Cornell University Medical College.

TO SERVE UNTIL 1923.

H. C. BUMPUS, Brown University.
R. A. HARPER, Columbia University.
W. A. LOCY, Northwestern University.
JACQUES LOEB, The Rockefeller Institute for Medical Research.
GEORGE T. MOORE, Missouri Botanical Garden, St. Louis.
L. L. NUNN, Telluride, Colo.
W. J. V. OSTERHOUT, Harvard University.
WILLIAM M. WHEELER, Bussey Institution, Harvard University.

TO SERVE UNTIL 1922.

CORNELIA M. CLAPP, Mount Holyoke College.
E. G. CONKLIN, Princeton University.
ROSS G. HARRISON, Yale University.
CAMILLUS G. KIDDER, 27 William Street, New York City.
M. M. METCALF, Oberlin, Ohio.
WILLIAM PATTEN, Dartmouth College.
JACOB REIGHARD, University of Michigan.
W. B. SCOTT, Princeton University.

TO SERVE UNTIL 1921.

S. F. CLARKE, Williamstown, Mass.
CHARLES A. COOLIDGE, Ames Building, Boston, Mass.
C. R. CRANE, Woods Hole, Mass., *President of the Corporation.*
ALFRED G. MAYOR, Carnegie Institution.
C. E. McCLUNG, University of Pennsylvania.
T. H. MORGAN, Columbia University.
ERWIN F. SMITH, United States Department of Agriculture.
E. B. WILSON, Columbia University.

II. ACT OF INCORPORATION

No. 3170.

COMMONWEALTH OF MASSACHUSETTS.

Be It Known, That whereas Alpheus Hyatt, William Sanford Stevens, William T. Sedgwick, Edward G. Gardiner, Susan Minns, Charles Sedgwick Minot, Samuel Wells, William G. Farlow, Anna D. Phillips and B. H. Van Vleck have associated themselves with the intention of forming a Corporation under the name of the Marine Biological Laboratory, for the purpose of establishing and maintaining a laboratory or station for scientific study and investigation, and a

school for instruction in biology and natural history, and have complied with the provisions of the statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer, and Trustees of said Corporation, duly approved by the Commissioner of Corporations, and recorded in this office;

Now, therefore, I, HENRY B. PIERCE, Secretary of the Commonwealth of Massachusetts, *do hereby certify* that said A. Hyatt, W. S. Stevens, W. T. Sedgwick, E. G. Gardiner, S. Minns, C. S. Minot, S. Wells, W. G. Farlow, A. D. Phillips, and B. H. Van Vleck, their associates and successors, are legally organized and established as, and are hereby made, an existing Corporation, under the name of the MARINE BIOLOGICAL LABORATORY, with the powers, rights, and privileges, and subject to the limitations, duties, and restrictions, which by law appertain thereto.

Witness my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed, this twentieth day of March, in the year of our LORD ONE THOUSAND, EIGHT HUNDRED and EIGHTY-EIGHT.

HENRY B. PIERCE,

[SEAL.]

Secretary of the Commonwealth.

III. BY-LAWS OF THE CORPORATION OF THE MARINE BIOLOGICAL LABORATORY

I. The annual meeting of the members shall be held on the second Tuesday in August, at the Laboratory, in Woods Hole, Mass., at 12 o'clock noon, in each year, and at such meeting the members shall choose by ballot a Treasurer and a Clerk, who shall be, *ex officio*, members of the Board of Trustees, and Trustees as hereinafter provided. At the annual meeting to be held in 1897, not more than twenty-four Trustees shall be chosen, who shall be divided into four classes, to serve one, two, three, and four years, respectively, and thereafter not more than eight Trustees shall be chosen annually for the term of four years. These officers shall hold their respective offices until others are chosen and qualified in their stead. The Director and Assistant Director, who shall be chosen by the Trustees, shall also be Trustees, *ex officio*.

II. Special meetings of the members may be called by the Trustees, to be held in Boston or in Woods Hole at such time and place as may be designated.

III. The Clerk shall give notice of meetings of the members by

publication in some daily newspaper published in Boston at least fifteen days before such meeting, and in case of a special meeting the notice shall state the purpose for which it is called.

IV. Twenty-five members shall constitute a quorum at any meeting.

V. The Trustees shall have the control and management of the affairs of the Corporation; they shall present a report of its condition at every annual meeting; they shall elect one of their number President and may choose such other officers and agents as they may think best; they may fix the compensation and define the duties of all the officers and agents; and may remove them, or any of them, except those chosen by the members, at any time; they may fill vacancies occurring in any manner in their own number or in any of the offices. They shall from time to time elect members to the Corporation upon such terms and conditions as they may think best.

VI. Meetings of the Trustees shall be called by the President, or by any two Trustees, and the Secretary shall give notice thereof by written or printed notice sent to each Trustee by mail, postpaid. Seven Trustees shall constitute a quorum for the transaction of business. The Board of Trustees shall have power to choose an Executive Committee from their own number, and to delegate to such Committee such of their own powers as they may deem expedient.

VII. The President shall annually appoint two Trustees, who shall constitute a committee on finance, to examine from time to time the books and accounts of the Treasurer, and to audit his accounts at the close of the year. No investments of the funds of the Corporation shall be made by the Treasurer except approved by the finance committee in writing.

VIII. The consent of every Trustee shall be necessary to dissolution of the Marine Biological Laboratory. In case of dissolution, the property shall be given to the Boston Society of Natural History, or some similar public institution, on such terms as may then be agreed upon.

IX. These By-Laws may be altered at any meeting of the Trustees, provided that the notice of such meeting shall state that an alteration of the By-Laws will be acted upon.

X. Any member in good standing may vote at any meeting, either in person or by proxy duly executed.

IV. THE TREASURER'S REPORT

MARINE BIOLOGICAL LABORATORY BALANCE-SHEET,

DECEMBER 31, 1920.

<i>Assets.</i>			
Cash:			
In bank.	\$	572.52	
Petty cash fund.		200.00	\$ 772.52
<hr/>			
Notes receivable (secured).....			1,000.00
Accounts receivable.....			11,706.37
Inventories:			
Supply department.....	\$	15,796.63	
BIOLOGICAL BULLETIN.....		3,995.02	19,791.65
<hr/>			
Investments:			
Securities (Schedule I.).....	\$	11,697.43	
Cash (Schedule II.).....		712.23	12,409.66
<hr/>			
Stock in General Biological Supply House, Inc.....			12,500.00
Gansett property account.....	\$	19,739.27	
Less mortgage.....		12,132.01	7,607.26
<hr/>			
Educational Plant (Schedule III.): Land.....	\$	95,856.14	
Buildings.....		191,301.09	
Equipment.....		89,110.40	
<hr/>			
		\$376,267.63	
Less reserve for depreciation.....		34,799.48	341,468.15
<hr/>			
Deferred charges:			
Prepaid insurance.....			3,832.17
Items in suspense.....			35.85
<hr/>			
			\$411,123.63
<i>Liabilities.</i>			
Accounts payable.....	\$	4,631.49	
Notes payable:			
Falmouth National Bank.....	\$	5,000.00	
Issued in part payment of shares of General Biological			
Supply House, Inc. purchased.....		2,500.00	7,500.00
<hr/>			
Accrued charges (estimated).....			1,000.00
Trust funds.....	\$	10,409.66	
Note payable issued on account of purchase of reserve			
fund securities.....		2,000.00	12,409.66
<hr/>			
			\$ 25,541.15

Balancing account:

Balance, January 1.....	\$359,923.00		
Inventories and sundry capital expenditures set up during year.....	22,996.65		
Special donations.....	8,500.00		
Appropriation from Library Fund for purchase of books.....	813.91		
			\$392,234.46
Deduct, net loss on mess hall and equipment destroyed by fire March 17, 1920.....	\$6,041.33		
Deduct, excess of expenses for year	610.65	6,651.98	385,582.48
			<u>\$411,123.63</u>

MARINE BIOLOGICAL LABORATORY, INCOME-AND-EXPENSE
FOR YEAR ENDED DECEMBER 31, 1920

	Expense	Income	Loss	Gain
Administration expenses.....	\$ 9,114.98		\$ 9,114.98	
Bar Neck property expenses.....	184.00		184.00	
BIOLOGICAL BULLETIN and annual dues.....	4,891.86	3,105.75	1,786.11	
BIOLOGICAL BULLETIN, additional expenses for 1919.....	886.72		886.72	
Carpenter department.....	909.38	22.90	886.48	
Chemical department.....	1,647.58		1,657.58	
Dormitories.....	2,219.51	2,234.18		14.67
Instruction.....	6,615.36	5,960.00	655.36	
Interest on notes payable.....	126.55		126.55	
Janitor's house expenses.....	3.31		3.31	
Lectures, evening.....	28.22		28.22	
Lectures, philosophical.....	100.00		100.00	
Library department.....	2,018.95		2,018.95	
Maintenance, buildings and grounds.....	6,057.05		6,057.05	
Mess.....	23,214.76	23,476.72		261.96
New laboratory expenses.....	2,820.61		2,820.61	
Newman Cottage.....	49.61		49.61	
Pumping station.....	228.66		228.66	
Research department.....	2,571.15	4,450.00		1,878.85
Sundry expense and income.....	946.27	7,030.75		6,084.48
Supply department.....	37,672.24	43,662.74		5,990.50
Truck.....	790.87		790.87	
Total current expenses.....	\$103,097.64		\$27,385.06	
Total current income.....	89,943.04	\$89,943.04	14,230.46	\$14,230.46

TREASURER'S REPORT.

7

	Expense	Income	Loss	Gain
Excess of expenses.....	\$13,154.60		\$13,154.60	
Reserve for depreciation	7,270.69			
Bad accounts written off.....	245.36			
	<u>\$20,670.65</u>			
Donations:				
Friendship Fund \$20,000.00				
Other	60.00	20,060.00		
	<u> </u>	<u> </u>		
Balance to balancing account....	\$610.65			

MARINE BIOLOGICAL LABORATORY, SUMMARY OF INVENTORY OF
LAND, BUILDINGS, AND EQUIPMENT, DECEMBER 31, 1920.

A. Land, January 1, 1920.....		\$ 95,856.14
B. Buildings, January 1, 1920.....	\$174,713.44	
Permanent improvements during year:		
New mess hall.....	14,400.46	
Supply department laboratory.....	9,205.08	
New laboratory (chemical room extra).....	670.94	
Janitor's house.....	628.41	
New laboratory (third floor improvements) ..	203.14	
Supply department improvements.....	14.10	
Mess improvements.....	27.92	
	<u>\$199,863.49</u>	
New refrigerator built in 1919	1,321.57	
	<u>\$201,185.06</u>	
Deduct cost of mess hall destroyed by fire March		
17, 1920	9,883.97	191,301.09
C. Equipment, January 1, 1920.....	\$ 78,179.37	
Expenditures for new equipment during year:		
Mess hall	6,414.44	
Books and periodicals for library.....	2,686.16	
New truck	728.14	
Chemical department.....	267.30	
Carpenter shop.....	113.87	
Gas machine	108.80	
Supply department.....	103.50	
New laboratory.....	57.49	
Main building.....	11.08	
Dormitories.....	10.00	
Miscellaneous.....	56.14	
	<u>\$88,736.29</u>	

Cost of books and periodicals purchased in 1916, 1917, 1918, and 1919 set up	3,951.15	
	<hr/>	
	\$92,687.44	
Deduct cost of mess hall equipment destroyed by fire March 17, 1920.....	3,577.04	89,110.40
	<hr/>	
		\$376,267.63

January 20, 1921.

MR. D. BLAKELY HOAR,
161 Devonshire Street,
Boston.

Dear Sir: We have completed our audit of the accounts of the Marine Biological Laboratory for the year ended December 31, 1920, as kept both at your office in Boston and at Woods Hole, and report thereon in the accompanying exhibits and schedules:

Exhibit A—Balance-Sheet as of December 31, 1920.

B—Income-and-Expense for the Year ended December 31, 1920.

Schedule I—Investments (Book Values).

II—Cash Receipts and Payments on Account of Investments.

III—Summary of Inventory of Land, Buildings, and Equipment.

IV—Depreciation Reserve.

V—Supply Department Income-and-Expense for the Year ended December 31, 1920.

We certify that, subject to the comments herewith, the balance-sheet and income-and-expense statement shown in Exhibits A and B are in accordance with the books and correct to the best of our knowledge and belief.

Very respectfully,
HARVEY S. CHASE & Co.,
Certified Public Accountants.

V. REPORT OF THE LIBRARIAN.

The Library has continued to make a satisfactory growth. The total accessions during the year, not counting periodicals received in parts, were 795 items, of which 175 were received by purchase, 93 by binding, and 514 by gift and exchange. After deducting 13 duplicate volumes removed from the collection, the net increase was 408 volumes and 387 pamphlets, making the total contents of the library on December 31, 1920, 10,243 volumes and 8,532 pamphlets.

The current periodicals and other serial publications, received during the year, comprised 153 titles, of these 83 were received by subscription, 38 in exchange for the BIOLOGICAL BULLETIN, and 32 were gifts. The list of periodicals was increased over the previous year by the addition of 21 titles.

The appropriation of part of the reserve Library Fund made it possible to fill up the gaps in the sets of German periodicals occasioned by the interruption of communication during the war, and also to complete the sets of a number of important journals. As the result of much labor and correspondence the following sets were completed: *Archiv für mikroskopische Anatomie* (except 2 vols.), *Archives de Biologie*, *Biochemical Journal*, *Botanical Abstracts*, *Journal of the New York Botanical Garden*, *Journal of the Royal Microscopical Society*, *New Phytologist* (except 1 vol.), *Parasitology*.

There are still many important sets of journals in the library that are incomplete. And one of the pressing needs of the Laboratory is funds with which to purchase the volumes necessary to complete them.

During the summer the library was in constant use by officers and students of the Laboratory and much of the time of the Assistant Librarian was taken up with assisting readers and attending to the circulation of books. About 1,000 books and periodicals were lent for use outside of the Library.

When the collection was small, the arrangement of the books and pamphlets was a simple matter, and there was little need of a catalogue, except as a matter of record. The collection has

now reached so considerable a size that it has become necessary to adopt a definite system of classification and to revise the catalogue so as to make it a useful instrument for finding a book or in searching the literature on a given subject. After careful consideration of the various schemes of classification in general use, it was decided to use, with some modifications, the Dewey Decimal Classification. The main reason for adopting this system was that it seems to be the one most familiar to biologists. During the spring the bound volumes were rearranged and roughly classified according to this system, and during the autumn this work has been continued. The classification is nearly completed, and the corresponding numbers have been placed on the books and on the cards in the catalogue. It is hoped that this work will greatly facilitate the use of the library during the coming summer.

The old arrangement of the pamphlets, alphabetically by authors, has been retained, and in order to aid in finding them, numbers have been assigned to them and have been placed on the catalogue cards; the Cutler notation being used for this purpose.

For the bound volumes a new catalogue has been started on the dictionary principle, author, title and subject entries being arranged in one alphabet.

Much work has still to be done, but it is hoped that the books and the catalogue may ultimately be arranged so as to make the resources of the Library as quickly and easily available as possible.

Another important aim for the future is to complete the sets of important periodicals, and to gather together a complete set of the reprints of investigators, so that the library will fully represent the work done directly or indirectly in the Laboratory. And finally it is hoped that it may be possible to develop the Library symmetrically, so that each branch of Biology may be equally well represented on its shelves.

In conclusion, grateful acknowledgment should be made of the many generous gifts to the Library. Gifts of money have been received from Dr. M. M. Metcalf, \$50.00 toward the purchase of volumes of periodicals to complete sets; and from Dr. A. G. Mayor, \$10.00 for subscriptions to current journals.

Books have been received from Dr. Marianna L. Herwerden, Dr. E. G. Spaulding, Dr. Dunn, Dr. A. R. Moore, Rev. Mr. Tingley, Mrs. Charles R. Crane, Dr. F. R. Lillie, Dr. Christine Ladd-Franklin, Dr. Otto C. Glaser, the New York Botanical Garden, and others.

ROBERT P. BIGELOW,
Librarian.

VI. THE DIRECTOR'S REPORT.

January 1, 1921.

TO THE TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY.

Gentlemen: I beg to present herewith a report of the thirty-third session of the Laboratory for the year 1920:

On March 17, 1920, the dining hall, kitchen and laundry of the Laboratory were entirely destroyed by a fire which started in the machine shop of the Bureau of Fisheries across the street, and was blown by a strong west wind directly on to our buildings. Although the fire started at 4.30 A.M. the entire town turned out, and by hard work succeeded in saving the other buildings of the Laboratory. A meeting of the members of the Board of Trustees resident in New York and vicinity was hurriedly called on March 20th at the home of Mr. Crane, and voted that "the officers of the Laboratory be empowered to make necessary arrangements to replace the buildings and equipment destroyed by fire, enlarging the same if deemed advisable; and that the Director and Treasurer be given power to borrow the funds necessary for these purposes." A waiver of notice of time and place of this meeting was then sent out and was signed by all members of the Board.

Dr. Drew took charge of the building operations, and, in spite of the unprecedentedly bad conditions of the market both for labor and materials, he succeeded with the loyal assistance of the Laboratory crew in getting the buildings and equipment ready for opening at the regular time. As the amount of insurance had remained at pre-war rates, a very heavy net loss resulted, which is recorded in the Treasurer's report.

This accident resulted in the interruption of construction of the laboratory of the Supply Department, referred to in my previous report, which was under way at the time, and in diversion of the funds set apart for this purpose. In this emergency Mr. Crane again came to our assistance and furnished the funds needed for the completion of the Supply Department laboratory, the building of which was resumed in the late summer, and is now in process of completion.

The number of colleges, universities and other institutions that coöperate with the Laboratory by subscribing for research rooms and for investigators' or students' tables continues to grow. In 1915 there were 37; 1916, 40; 1917, 38; 1918, 33; 1919, 48; 1920, 52. (See appended list.)

The attendance at the Laboratory was again so large as to tax the capacity of the buildings to the uttermost. The tabular view of attendance (p. 26) shows a total attendance of 256 of whom 120 were students in courses. It was felt that the student laboratories had been unduly crowded last year, especially in embryology and physiology, and a number of student applications were therefore refused, and this explains the slightly smaller student attendance in 1920 compared with 1919. The number of investigators was 136 in 1920, 134 in 1919.

It was felt to be necessary to increase research space for another year, and it was therefore decided to complete the unfinished half of the third floor of the brick building hitherto used for storage. Aid for this work came from the Eli Lilly Co., of Indianapolis, through Dr. G. H. A. Clowes of their research laboratory, who had been carrying on biochemical investigations at the Laboratory for several years. Later the Nela Research Laboratory of the National Lamp Works of the General Electric Co. entered into a similar arrangement through Dr. R. S. Lillie, who was appointed biologist in their organization. By the terms of agreements entered into with these companies they will contribute funds to complete for their own use definitely assigned sections of the new research space, and pay the usual annual fees for their workers at the Laboratory, which on its part agrees to furnish the usual assistance rendered to research workers at the

Laboratory; these agreements run for a period of ten years. The Eli Lilly Co. rooms will be specially equipped for biochemistry, and the Nela Research Laboratory rooms for biophysics, especially radiation work. Thus experience of the special needs in these subjects will be gained in advance of the contemplated erection of a special laboratory for biochemistry and biophysics. The greater part of the new space is involved in these assignments, but other space is also thereby released, making a net gain to the Laboratory of five research rooms.

Additional research rooms can also be secured by the temporary occupation of a portion of the new Supply Department Laboratory, so that accommodations will be more ample for 1921. The relief must, however, be very temporary, and accordingly comprehensive plans for the future development of the Laboratory were studied by members of the Board of Trustees during the summer.

It was decided that any new construction should be part of a plan calculated to meet the needs of the present generation of biologists, and accordingly Mr. Charles A. Coolidge was requested, and kindly consented, to prepare such plans. The obvious immediate needs call for two new buildings, a laboratory building specially equipped for biochemistry and biophysics, and a building for library and administration purposes containing also an auditorium. Future development will require an additional laboratory unit, and this also was included in the plans.

The first two of these buildings should be constructed immediately. As regards the first: not only is present research space inadequate, but, as noted in the last report, the present wooden buildings are not well adapted to the more rigorous needs of modern experimental research. The new laboratory would be fully occupied at once by workers transferred from the old buildings who require the special facilities proposed, and this would leave more space in the old buildings for those whose work has other technical requirements. This building is the one approved by the National Research Council as one of their projects, as related in the report for 1919.

A committee was appointed by the Trustees to consider the

internal plans of this building in consultation with Mr. Coolidge. The members of this committee are C. E. McClung (chairman), G. H. A. Clowes, R. S. Lillie, A. P. Mathews and W. J. V. Osterhout. Plans have been drawn up after much study, making the building a wing of the present brick research laboratory extending to the west. It will include about 36 research laboratories and rooms, five dark rooms and laboratories, refrigeration and constant temperature rooms, and space for storage. Some of the research laboratories and rooms will have a strictly biological equipment, others a biochemical equipment, others again biophysical equipment; and it is proposed to interrelate the various types for the most effective coöperation. It is expected that the facilities will be adequate for the most exacting kinds of physical and chemical work adapted to biological analysis.

The second building will extend to the north of the proposed new laboratory and will be connected with it by a corridor. It will be primarily a library building, calculated to be sufficient for the library development of many years to come, and capable of expansion if needed. Administration offices, committee rooms and a demonstration hall will occupy the first floor; and an auditorium will be built out to the east (rear) with access from the demonstration hall. The facilities of this building are greatly needed at the present time. The present administration offices are too small, inconvenient for those who use them, and a source of distraction in the research building in which they are located. The present library rooms are already well filled, and do not provide space for much growth. The present lecture hall is so inadequate that the evening lectures are usually uncomfortably crowded, and attendance at them is discouraged. The committee in charge of this building is G. A. Drew (chairman), R. P. Bigelow, M. J. Greenman, George Lefevre and G. H. Parker.

The third proposed unit will be a laboratory building forming a wing of the present brick laboratory, extending to the east and balancing the proposed west wing. It is not anticipated that it will be needed for a few years yet.

The funds for these buildings and for their maintenance remain to be secured. The chairman of the Division of Biology and

Agriculture of the National Research Council is giving the project for the laboratory of biochemistry and biophysics unremitting personal attention, and other officers of the Council are interesting themselves in the matter as one of their chief projects. Building costs are, however, at their maximum just now, and it is doubtful that any who might be disposed to contribute to these buildings would consider it wise to undertake construction until there has been a considerable reduction of prices. In the meantime, if representatives of all of the 50 or more coöperating universities, colleges and research organizations, and of the industrial research laboratories interested would unite their efforts, the way should be open soon for the construction of the first of these units. The Library, Administration and Lecture Hall building should appeal to a still wider circle, including those interested in the development of Woods Hole as a summer home.

It is perhaps not generally recognized to what an extent costs of operation have increased during the last few years: in 1918 the total current expenditures of the Laboratory amounted to \$69,687.14, in 1919 to \$88,452.64 and in 1920 to \$103,097.64. The current *earned* income for the same years was \$54,282.05 (1918), \$80,307.57 (1919) and \$89,943.04 (1920). This period was one of rapidly mounting costs in supplies of all kinds and in labor;¹ it is not to be expected that 1921 will show an appreciable increase over 1920; indeed, it is to be hoped that some saving can be effected through the fall in prices. It is a matter for congratulation that the various earning departments of the Laboratory were able to keep up with rising prices so that the excess of expenses over income, which is covered by donations, was \$7,300.02 less in 1919, and \$2,251.49 less in 1920, than in 1918. The Supply Department is largely responsible for this good showing, having increased its income from \$22,608.04² in 1918 to \$43,662.74 in 1920, while its expenses increased during the same period from \$25,611.73² in 1918 to \$37,672.24 in 1920.

¹ The costs of salaries and wages in 1918, 1919 and 1920 were \$33,630.06, \$40,307.28 and \$54,097.67 respectively.

² The system of accounting for the Supply Department was changed in 1919, and the figures given for 1918 are arrived at by applying the 1919 system to the figures given in the treasurer's report for 1918.

Thus an actual loss in 1918 was converted into a reasonable profit both in 1919 and 1920. But all departments show increase of expense, and all earning departments increase of income.

The financial difficulties of 1920 came not from the cost of ordinary operations, but from the losses incident to the fire, and the increased insurance which it was felt necessary to place on the buildings and equipment, and from other capital expenditures. The cost of replacing the mess hall and equipment amounted to \$20,814.90 in 1920. The insurance received on the old mess hall and contents was \$6,318.54. The net expenditure on this item was therefore \$14,496.36. The cost of new insurance was \$4,194.72, and, although this covers three to five years insurance, the payments had to be made during the year. Expenditures on the new Supply Department Laboratory exceeded Mr. Crane's special gift by \$705.08 during the year. \$2,500.00 was invested in new stock of the General Biological Supply House. These expenditures, amounting to \$21,896.16, will explain how a cash balance of \$14,277.69 on December 31, 1919, was reduced to \$772.52 on December 31, 1920, and why it was necessary to borrow \$5,000.00 from the Falmouth National Bank. With the cessation of such capital expenditures the current income is adequate to carry all ordinary current expenditures.

Since 1896 the charge for tuition in each of the courses has been \$50.00. In 1920 the cost of instruction was \$6,615.36 and the income \$5,960.00. The salaries paid the instructors, though somewhat increased in the last two years, have been kept consistently low. There are no charges for use of the boats or for equipment, rent, or depreciation. Applications for admission to courses have exceeded accommodations in the last two years. As our Laboratory is primarily a research institution, it is believed that instruction should be self-supporting and of a rigorously professional type. It was therefore decided to raise the fee for each course of instruction to \$75.00 beginning 1921. It is hoped that the increase will not debar any who are professionally interested; a hindrance that will exclude any not so interested will not be harmful to the research activities of the Laboratory.

There are appended as parts of this report, lists of the staff and of investigators and students for 1920, a tabular view of attendance from 1916-1920; also lists of the coöperating and subscribing institutions, of the evening lectures and of membership of the Corporation.

1920.

THE STAFF

FRANK R. LILLIE, *Director*, Professor of Embryology, and Chairman of the Department of Zoölogy, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

ZOÖLOGY.

I. INVESTIGATION.

GARY N. CALKINS, Professor of Protozoölogy, Columbia University.

E. G. CONKLIN, Professor of Zoölogy, Princeton University.

GILMAN A. DREW, Assistant Director, Marine Biological Laboratory.

GEORGE LEFEVRE, Professor of Zoölogy, The University of Missouri.

FRANK R. LILLIE, Professor of Embryology, The University of Chicago.

C. E. MCCLUNG, Professor of Zoölogy, University of Pennsylvania.

T. H. MORGAN, Professor of Experimental Zoölogy, Columbia University.

E. B. WILSON, Professor of Zoölogy, Columbia University.

II. INSTRUCTION.

W. C. ALLEE, Professor of Biology, Lake Forest College.

ROBERT HALL BOWEN, Instructor in Zoölogy, Columbia University.

J. A. DAWSON, Dalhousie University.

R. T. HANCE, Instructor in Zoölogy, University of Pennsylvania.

C. L. PARMENTER, Instructor in Zoölogy, University of Pennsylvania.

CHRISTIANNA SMITH, Instructor in Zoölogy, Mount Holyoke College.

J. P. VISSCHER, Graduate Student, Johns Hopkins University.

DONNELL B. YOUNG, Instructor in Biology, Dalhousie University.

PROTOZOÖLOGY.

I. INVESTIGATION.

(See Zoölogy.)

II. INSTRUCTION.

GARY N. CALKINS, Professor of Protozoölogy, Columbia University.

LOUISE H. GREGORY, Assistant Professor of Zoölogy, Barnard College.

EMBRYOLOGY.

I. INVESTIGATION.

(*See Zoölogy.*)

II. INSTRUCTION.

DAVID H. TENNENT, Professor of Biology, Bryn Mawr College.

CHARLES G. ROGERS, Professor of Comparative Physiology, Oberlin College.

HUBERT B. GOODRICH, Associate Professor of Zoölogy, Wesleyan University.

BENJAMIN H. GRAVE, Professor of Biology, Wabash College.

ELIZABETH A. SMITH, Assistant Professor of Zoölogy, University of Wisconsin.

PHYSIOLOGY.

I. INVESTIGATION.

ALBERT P. MATHEWS, Professor of Biochemistry, The University of Cincinnati.

RALPH S. LILLIE, Professor of Biology, Clark University.

HAROLD C. BRADLEY, Assistant Professor of Physiological Chemistry, University of Wisconsin.

II. INSTRUCTION.

RALPH S. LILLIE, Professor of Biology, Clark University.

WALTER E. GARREY, Professor of Physiology, Tulane University.

FRANK P. KNOWLTON, Professor of Physiology, Syracuse University.

R. A. SPAETH, School of Public Health, Johns Hopkins University.

PHILOSOPHICAL ASPECTS OF BIOLOGY AND ALLIED SCIENCES.

LECTURER.

EDWARD G. SPAULDING, Professor of Philosophy, Princeton University.

BOTANY.

I. INVESTIGATION.

S. C. BROOKS, Associate Professor of Physiology and Biochemistry, Bryn Mawr College.

EDWARD M. EAST, Professor of Experimental Plant Morphology, Harvard University.

ROBERT A. HARPER, Professor of Botany, Columbia University.
E. NEWTON HARVEY, Assistant Professor of Physiology, Princeton University.
WINTHROP J. V. OSTERHOUT, Professor of Botany, Harvard University.

II. INSTRUCTION.

IVEY F. LEWIS, Professor of Biology, University of Virginia.
WILLIAM RANDOLPH TAYLOR, Instructor in Botany, University of Pennsylvania.
CONRAD ZIRKLE, Instructor in Botany, University of Virginia.

LIBRARY.

ROBERT P. BIGELOW, Librarian and Associate Professor of Zoölogy and Parasitology, Massachusetts Institute of Technology. Librarian,
PRISCILLA B. MONTGOMERY (Mrs. Thomas H. Montgomery, Jr.).
Assistant Librarian.

CHEMICAL SUPPLIES.*

OLIVER S. STRONG, Associate Professor of Neurology, Columbia University, New York City, Chemist.

SUPPLY DEPARTMENT.

G. M. GRAY, Curator.	A. M. HILTON, Collector.
JOHN J. VEEDER, Captain.	J. MCINNIS, Collector.
E. M. LEWIS, Engineer.	F. G. GUSTAFSON, Collector in
A. W. LEATHERS, Head of Shipping	Botany.
Department.	RUTH WINKLEY, Clerk.

F. M. MACNAUGHT, Business Manager.
HERBERT A. HILTON, Superintendent of Buildings and Grounds.

* Compound microscopes, with two oculars and two objectives, rack and pinion and fine adjustment, may be rented for the season at \$7.00 each, provided notice is received by the Business Manager not later than June 15. Microscopes are not otherwise supplied by the Laboratory. See under Department of Chemical Supplies (p. 29).

2. STUDENTS AND INVESTIGATORS—1920

INDEPENDENT INVESTIGATORS—Zoölogy.

- ADDISON, WILLIAM H. F., Professor of Normal Histology and Embryology, University of Pennsylvania.
- ALLEE, WARDER C., Professor of Biology, Lake Forest College.
- ALTENBURG, EDGAR, Instructor in Biology, Rice Institute.
- AMBERSON, WILLIAM R., Graduate Fellow in Biology, Princeton University.
- ANDERSON, ERNEST G., Carnegie Institution, Cold Spring Harbor.
- BIGELOW, ROBERT P., Associate Professor of Zoölogy and Parasitology, Massachusetts Institute of Technology.
- BISHOP, GEORGE H., Instructor in Zoölogy, Northwestern University.
- BREITENBECKER, JOSEPH K., Assistant Professor of Biology, Western Reserve University.
- BUDINGTON, ROBERT A., Professor of Zoölogy, Oberlin College.
- CALKINS, GARY N., Professor of Protozoölogy, Columbia University.
- CAROTHERS, E. ELEANOR, University of Pennsylvania.
- CARPENTER, FREDERIC W., Professor of Biology, Trinity College.
- CARROLL, MITCHEL, Professor of Biology, Franklin and Marshall College.
- CHAMBERS, ROBERT, Assistant Professor of Anatomy, Cornell University Medical College.
- CHARLTON, HARRY H., University of Missouri.
- CLAPP, CORNELIA M., Professor Emeritus of Zoölogy, Mount Holyoke College.
- CLARK, ELIOT R., Professor of Anatomy, University of Missouri.
- CLARK, ELEANOR L., Columbia, Mo.
- COPELAND, MANTON, Professor of Biology, Bowdoin College.
- DANCHAKOFF, VERA, Assistant Professor of Anatomy, College of Physicians and Surgeons.
- DAWSON, JAMES A., Professor of Biology, Dalhousie University.
- DEDERER, PAULINE H., Associate Professor of Zoölogy, Connecticut College.
- DODDS, GIDEON S., Assistant Professor of Histology, West Virginia University.
- DREW, GILMAN A., Assistant Director, Marine Biological Laboratory, Woods Hole, Mass.
- GLASER, OTTO C., Professor of Biology, Amherst College.
- GOODRICH, HUBERT B., Associate Professor of Zoölogy, Wesleyan University.
- GRAVE, BENJAMIN H., Professor of Biology, Knox College.
- GRAVE, CASWELL, Professor of Zoölogy, Washington University.
- GREGORY, LOUISE H., Assistant Professor of Zoölogy, Barnard College.
- HANCE, ROBERT T., Instructor in Zoölogy, University of Pennsylvania.
- HARVEY, ETHEL BROWNE, Princeton, N. J.
- HEILBRUNN, LEWIS V., Instructor, University of Michigan.
- JACOBS, MERKEL H., Assistant Professor of Zoölogy, University of Pennsylvania.
- JENNINGS, HERBERT S., Professor of Zoölogy, Johns Hopkins University.
- JUST, ERNEST E., Professor of Zoölogy, Howard University.
- KINDRED, JAMES E., Assistant Professor of Biology, Western Reserve University.
- KNOWER, HENRY MCE., Professor of Anatomy, University of Cincinnati.

- LANGE, MATHILDE M., U. S. Dept. of Agriculture, New York City.
 LEFEVRE, GEORGE, Professor of Zoölogy, University of Missouri.
 LEWIS, WARREN H., Research Associate, Carnegie Institution of Washington.
 LEWIS, MARGARET R., Collaborator, Carnegie Institution of Washington.
 LILLIE, FRANK R., Chairman, Department of Zoölogy, University of Chicago.
 MALONE, EDWARD F., Professor of Histology, University of Cincinnati.
 MAST, SAMUEL O., Professor of Zoölogy, Johns Hopkins University.
 McCLUNG, CLARENCE E., Director of Zoölogical Laboratory, University of Pennsylvania.
 METZ, CHARLES W., Research Associate, Carnegie Institution, Cold Spring Harbor.
 MORRILL, CHARLES V., Assistant Professor of Anatomy, Cornell University Medical College.
 MULLER, HERMANN J., Instructor, Columbia University.
 NEAL, HERBERT V., Professor of Zoölogy, Tufts College, Mass.
 OBRESHKOVE, VASIL, Instructor, Syracuse University.
 PARKER, GEORGE H., Professor of Zoölogy, Harvard University.
 PARMENTER, CHARLES L., Instructor, University of Pennsylvania.
 PATTEN, WILLIAM, Professor of Biology, Dartmouth College.
 POWERS, EDWIN B., Instructor in Zoölogy, University of Nebraska.
 ROGERS, CHARLES G., Professor of Comparative Physiology, Oberlin College.
 ROOT, FRANCIS M., Associate in Med. Entomology, School of Hygiene and Public Health, Johns Hopkins University.
 SAGUCHI, SAKAE, Professor of Anatomy, Medical School, Kanazawa, Japan.
 SMITH, ELIZABETH A., Assistant Professor of Zoölogy, University of Wisconsin.
 SPEIDEL, CARL C., Adjunct Professor of Anatomy, University of Virginia.
 STOCKARD, CHARLES R., Professor of Anatomy, Cornell University Medical College.
 STRONG, OLIVER S., Associate Professor of Neurology, Columbia University.
 TAYLOR, CHARLES V., University of California.
 TENNENT, DAVID H., Professor of Biology, Bryn Mawr College.
 TRACY, HENRY C., Professor of Anatomy, University of Kansas.
 WHITE, GERTRUDE W., Instructor, Carnegie Institute of Technology.
 WIEMAN, HARRY L., Professor of Zoölogy, University of Cincinnati.
 WOOD, F. E., Professor of Biology, Illinois Wesleyan University.
 WOODWARD, ALVALYN E., Amherst College.
 ZELENY, CHARLES, Professor of Zoölogy, University of Illinois.

BEGINNING INVESTIGATORS—Zoölogy.

- AGERSBORG, H. P. K., Assistant in Zoölogy, Columbia University.
 BOWEN, ROBERT H., Instructor in Zoölogy, Columbia University.
 COHEN, BARNETT, Student, Yale University.
 DEMCREC, MILISLAV, Assistant, Carnegie Institution of Washington.
 DRIVER, CHARLES S., Columbia University.
 GUTHRIE, MARY J., Demonstrator, Bryn Mawr College.
 HARRAH, EZRA C., University of Illinois.
 HIBBARD, HOPE, Fellow in Biology, Bryn Mawr College.
 HINRICHS, MARIE A., Laboratory Assistant, University of Chicago.
 HUETTNER, ALFRED F., Assistant in Zoölogy, Columbia University.
 JOHNSON, HENRY H., JR., Assistant, Columbia University.

KING, ROBERT L., University of Pennsylvania.
KIRK, WINIFRED, Technician in Histology, Cornell University Medical College.
LANCEFIELD, DONALD E., Assistant, Columbia University.
LANCEFIELD, REBECCA C., Assistant, Carnegie Institution.
MASON, ELEANOR D., Assistant, Carnegie Institution.
MOSES, MILDRED S., Assistant, Carnegie Institution.
NUTE, BERTHA E., Teacher of Science, Hastings-on-Hudson, N. Y.
PAGE, IRVINE A., Chemist, Eli Lilly & Co., Indianapolis, Ind.
RICHTER, MAURICE N., Student, College of Physicians and Surgeons.
ROMER, ALFRED S., Columbia University.
SEIDLIN, SAMUEL M., Student, College of Physicians and Surgeons.
SMITH, CHRISTIANNA, Instructor, Mount Holyoke College.
SWETT, FRANCIS H., Assistant, Yale University.
VISSCHER, J. PAUL, Instructor, Johns Hopkins University.
WARREN, HERBERT S., Graduate Student, Columbia University.
WILLIAMS, DOROTHY E., Laboratory Assistant, Mount Holyoke College.
YOUNG, DONNELL B., Acting Professor of Biology, Dalhousie University.
YOUNG, HELEN D., Research Assistant, Columbia University.

INDEPENDENT INVESTIGATORS—Physiology.

BRADLEY, HAROLD C., Professor of Physiological Chemistry, University of Wisconsin.
BROOKS, SUMNER C., Biologist, Dept. of Public Health, Washington, D. C.
BROOKS, MATILDA M., 3809 Yuma St., Washington, D. C.
CLOWES, G. H. A., Director and Consulting Chemist, Research Laboratory, Eli Lilly & Co.
EDWARDS, DAYTON J., Instructor in Physiology, Cornell University Medical College.
FENN, WALLACE O., Instructor in Applied Physiology, Harvard Medical School.
GARREY, WALTER E., Professor of Physiology, Tulane University.
HARVEY, E. NEWTON, Professor of Physiology, Princeton University.
HECHT, SELIG, Assistant Professor of Physiology, Creighton University.
HOOKER, DONALD R., Associate Professor, Johns Hopkins University.
IRWIN, MARIAN, 46 Shepard St., Cambridge, Mass.
KNOWLTON, FRANK P., Professor of Physiology, Syracuse University.
LILLIE, RALPH S., Professor of Biology, Clark University.
LOEB, JACQUES, Head of Division of Experimental Biology, Rockefeller Institute.
LOEB, LEO, Professor of Comparative Pathology, Washington University.
MATHEWS, ALBERT P., Professor of Biochemistry, University of Cincinnati.
MORGULIS, SERGIUS, Professor of Biochemistry and Physiology, Creighton University College of Medicine.
PORTER, EUGENE L., Assistant Professor of Physiology, Western Reserve University.
SPAETH, REYNOLD A., Associate in Physiology, School of Public Health, Johns Hopkins University.
SPAULDING, E. G., Professor of Philosophy, Princeton University.
STEHLE, RAYMOND L., Assistant Professor of Physiological Chemistry, Medical School, University of Pennsylvania.
VON HERWERDEN, MARIANNE, University of Utrecht, Utrecht, Holland.

BEGINNING INVESTIGATORS—Physiology.

BACHMAN, EDA, Research Chemist, Eli Lilly & Co.
 BASKERVILL, MARGARET L., Graduate Student, Columbia University.
 FREIBERG, JOSEPH A., Medical College, University of Cincinnati.
 KEITH, LUCILE G., Research Chemist, Eli Lilly & Co.
 POND, SAMUEL E., Fellow, Clark University.
 SAMPSON, MYRA M., Assistant Professor, Smith College.
 YOSHIDA, SADA O., Professor, Osaka Medical College, Japan.

INDEPENDENT INVESTIGATORS—Botany.

HAZEN, TRACY E., Assistant Professor of Botany, Columbia University.
 LEWIS, IVEY F., Professor of Biology, University of Virginia.
 OSTERHOUT, WINTHROP J. V., Professor of Botany, Harvard University.
 PHILLIPS, EVERETT F., Agriculturist, U. S. Dept. of Agriculture, Washington.
 SCHRAMM, JACOB R., Professor of Botany, Cornell University.
 TAYLOR, WILLIAM R., Instructor, University of Pennsylvania.
 ZIRKLE, CONWAY, University of Virginia.

BEGINNING INVESTIGATORS—Botany.

GLUCK, MARGUERITE L., 2010 7th Ave., New York City.
 INMAN, ONDESS L., Harvard University.

1920.

STUDENTS**ZOOLOGY.**

BALL, RUTH J., Assistant in Zoölogy Department, University of Vermont.
 BELZER, KATHARINE, Student, Butler College.
 BERRY, GEORGE P., Princeton University.
 BISSONNETTE, THOMAS H., University of Chicago.
 BLAIR, MONTGOMERY, JR., Student, Princeton University.
 BUHRER, EDNA M., Student, Goucher College.
 BUCKNELL, LYDIA E., Student, Oberlin College.
 CASS, MILDRED F., Student, Doane College.
 CATTELL, QUINTA, Garrison, N. Y.
 CATTELL, WARE, Student, Columbia University.
 CONKLIN, ISABEL, Student, Smith College.
 CONOVER, L. LENORE, Detroit Normal College, Detroit, Mich.
 COVENTRY, FRANCES A., Goucher College.
 CROZIER, ANNIE J., Hunter College.
 DRAKE, DOROTHY, Student, Simmons College.
 EASTON, CHARLOTTE, Skidmore School of Arts.
 EDSON, EDITH M., 511 Dewey Ave., Rochester, N. Y.
 EIMERT, HELEN K., Student, Oberlin College.
 ELIOT, ELLEN P., Student, Simmons College.
 FLANAGAN, MARY C., Student, Simmons College.

FRUIT, IRMA B., Student, Knox College.
GRAVES, ISABELLE A., Student, Simmons College.
GREEN, WILMOTH, Teaching Fellow, Washington University.
GREGORY, ELIZABETH, Sophie Newcomb College.
GRIFFIN, MARY A., 615 McDonough St., Brooklyn, N. Y.
HERSHBERGER, RALPH E., Student, Heidelberg University.
HICKMAN, CLEVELAND P., Assistant in Zoölogy, University of Michigan.
HICKMAN, JENNINGS R., Assistant in Zoölogy, University of Michigan.
HOLE, FRANCES L., Student, Doane College.
HOOK, FLORA E., Head of Biology Department, East Orange High School.
HURD, ARCHER L., Student, Wesleyan University.
JOHNSON, MARIE M., Knox College.
KAAN, HELEN N., Assistant in Biology, Wheaton College.
KEELER, MARGER Y, 28 Strawberry Hill, Stamford, Conn.
KIDNEY, MARY L., Teacher, Junior High, Quincy, Ill.
LARSON, JEAN C., Student, Oberlin College.
LEWIS, CLARA D., Student, Sophie Newcomb College.
LYMAN, ANNIE K., Student, Mount Holyoke College.
MATTER, KATHERINE E., Student, Oberlin College.
MCCOLLUM, RUTH, Student, Oberlin College.
MCDOWELL, CLAIRE, Laboratory Assistant, Mount Holyoke College.
MILLER, MINNIOLA O., Student, Connecticut College.
MILLIKIN, NEIL, Student, Johns Hopkins University.
MOSSMAN, ALEXANDER H., Amherst College.
OSGOOD, GEORGE W., Student, Tufts College.
QUINNAN, BERTHA C., Teacher, Pauline Shaw School, Boston.
POTTER, GRACE M., Student, Mount Holyoke College.
ROOT, SERAPH D., Student, Russell Sage College.
SEARCY, AUGUSTA T., Instructor in Biology, University of Alabama.
SHAHN, BENJAMIN H., Student, New York University.
SHEEHAN, FRED M., Student, Lake Forest College.
STOLL, HAROLD F., Student, Western State Normal School.
THORP, ERICA, 115 Brattle St., Cambridge, Mass.
WILLIAMS, S. CULVER, Student, Wesleyan University.
VOLTON, LEROY W., Student, Illinois Wesleyan University.
ZOOMAYA, EZRA B., Student, Lake Forest College.

PROTOZOÖLOGY.

DIETRICH, BERTHA K., Teacher, Bushwick High School, Brooklyn.
ELLIOTT, MARGARET E., Teaching Assistant, Wellesley College.
FARRAR, HILDA, Teacher of Biology, East High School, Rochester, N. Y.
GREENLEAF, WILLIAM E., Graduate Student, Yale University.
HELBIG, DOROTHY M., Hunter College.
LACKEY, JAMES B., Mississippi College.
LEIVA, LAMBERTO, Instructor in Parasitology, University of the Philippines.
LOWTHER, MRS. FLORENCE DEL., Instructor, Barnard College.
PROVOST, MARGARET, Teacher of Biology, Wadleigh High School, New York City.
SHEPPARD, ALICE E., 722 King St., Pottstown, Pa.

SPENCER, CLEMENTINA S., Assistant Professor, Coe College.
TUBANGUI, MARCOS A., Fellow, University of the Philippines.
UHLEMEYER, BERTHA, Assistant, Washington University.
WALLACE, GRACE N., Mount Holyoke College.
YOCUM, HARRY B., Assistant Professor, College of the City of New York.

EMBRYOLOGY.

BEAN, RAYMOND J., Instructor, Western Reserve University.
BURNS, ROBERT K., Bridgewater College.
COLDWELL, ESTHER I., Graduate Student, Johns Hopkins University.
DURYEY, ARTHUR W., Student, Dartmouth College.
FRIES, ERIK F. B., Student, Harvard University.
GRAHAM, MARGARET A., Instructor, Hunter College.
HALL-QUEST, SHIRLEY K., Clifton, Cincinnati, Ohio.
HANNUM, MARGARET H., Student, Smith College.
HERMETET, MCGREER, Student, Knox College.
HIPPOLITUS, JENNIE D., Student, Connecticut College.
JOHNSON, HELEN G., Teacher, Hartford High School.
JOHNSON, HENRY H., JR., Assistant in Zoölogy, Columbia University.
MA, P. W., North China Union College.
MCCLUNG, RUTH C., Student, Kansas University.
MONTANUS, JOHN J., Student, Long Island College Hospital.
PAXSON, ELEANOR M., Student, Swarthmore College.
PEARSE, HERMAN E., JR., Student, University of Missouri.
RAND, ELIZABETH P., Student, Wellesley College.
ROBBINS, HARRIET L., Teacher of Biology, Kansas Wesleyan University.
SIMKINS, CLEVELAND S., Harvard University.
SMITH, LOUISE, Instructor in Zoölogy, Smith College.
STACEY, HELEN R., Vassar College.
THOMPSON, MARTHA L., Teaching Fellow, University of California.
WALTERS, MARY J., 1633-29th St., N.W., Washington, D. C.
WILLIAMSON, JANET A., Instructor in Zoölogy, Mount Holyoke College.
WONDERGEM, HENRY E., University of Rochester.

PHYSIOLOGY.

CHACE, EUNICE E., Instructor, Smith College.
CROFTS, ELIZABETH E., Oberlin College.
GILSON, ARTHUR S., JR., Student, Harvard University.
GREENE, WALTER F., Assistant Instructor, Yale University.
HANNA, LEILA O., University of Toronto.
HEIZER, PAULINE, Student, Radcliffe College.
JOHNSON, GEORGE E., Professor of Biology, University of Porto Rico.
KLOPP, JOHN W., Swarthmore College.
KUYK, MARGARET P., Professor of Physiology and Hygiene, University of Richmond.
MALL, MARY L., Bryn Mawr College.
POLLAK, MARION H., 135 West 87th St., New York City.
THOMPSON, JAMES T., Wabash College.

WEED, ELEANOR H., Vassar College.

WOLFF, NATHANIEL S., 25 Portsmouth Terrace, Rochester, N.Y.

YEN, HUI C., Oberlin College.

BOTANY.

AMORY, WALTER, Student, Harvard University.

CHUTE, RICHARD, Student, Harvard University.

DODGE, CARROLL W., Assistant Professor of Botany, Brown University.

MADER, VIVIENNE C., Student, Connecticut College.

MASON, MARIAN, Student, Vassar College.

OSTERHOUT, ANNA M., Student, Vassar College.

ROGERS, LENETTE M., Student, Mount Holyoke College.

TODD, JESSIE E., 4539 Jackson Boulevard, Chicago, Ill.

3. TABULAR VIEW OF ATTENDANCE

	1916	1917	1918	1919	1920
INVESTIGATORS—Total.....	129	129	93	134	136
Independent:					
Zoölogy.....	70	63	51	68	69
Physiology.....	23	23	16	24	22
Botany.....	7	8	5	7	7
Under Instruction:					
Zoölogy.....	25	24	16	21	29
Physiology.....	3	6	3	10	7
Botany.....	1	5	2	4	2
STUDENTS—Total.....	102	83	69	128	120
Zoölogy.....	50	46	41	55	56
Protozoölogy.....	—	—	—	15	15
Embryology.....	26	16	12	33	26
Physiology.....	14	13	10	17	15
Botany.....	12	8	6	8	8
TOTAL ATTENDANCE.....	231	212	162	262	256
INSTITUTIONS REPRESENTED—Total.....	73	77	72	88	86
By investigators.....	51	60	49	61	55
By students.....	45	36	38	62	57
SCHOOLS AND ACADEMIES REPRESENTED.					
By investigators.....	—	2	—	—	1
By students.....	3	5	—	4	7

4. COÖPERATING AND SUBSCRIBING INSTITUTIONS—1920

BARNARD COLLEGE
BOWDOIN COLLEGE
BRYN MAWR COLLEGE
BUTLER COLLEGE
CARNEGIE INSTITUTION OF WASHINGTON
CARNEGIE INSTITUTION, COLD SPRING HARBOR
COLUMBIA UNIVERSITY
CONNECTICUT COLLEGE
CORNELL UNIVERSITY MEDICAL COLLEGE
CREIGHTON UNIVERSITY
DARTMOUTH COLLEGE
DOANE COLLEGE
ELI LILLY & Co.
GOUCHER COLLEGE
HARVARD UNIVERSITY
HARVARD UNIVERSITY MEDICAL SCHOOL
HUNTER COLLEGE
JOHNS HOPKINS UNIVERSITY
KNOX COLLEGE
LAKE FOREST COLLEGE
MOUNT HOLYOKE COLLEGE
OBERLIN COLLEGE
PRINCETON UNIVERSITY
RADCLIFFE COLLEGE
RICE INSTITUTE
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH
SIMMONS COLLEGE
SMITH COLLEGE
SOPHIE NEWCOMB COLLEGE
TRINITY COLLEGE
UNIVERSITY OF CHICAGO
UNIVERSITY OF CINCINNATI
UNIVERSITY OF ILLINOIS
UNIVERSITY OF KANSAS
UNIVERSITY OF MICHIGAN
UNIVERSITY OF MISSOURI
UNIVERSITY OF PENNSYLVANIA

UNIVERSITY OF PENNSYLVANIA MEDICAL SCHOOL
 UNIVERSITY OF THE PHILIPPINES
 UNIVERSITY OF ROCHESTER
 UNIVERSITY OF TORONTO
 UNIVERSITY OF VERMONT
 UNIVERSITY OF WISCONSIN
 VASSAR COLLEGE
 WASHINGTON UNIVERSITY
 WELLESLEY COLLEGE
 WESLEYAN UNIVERSITY
 WESTERN RESERVE UNIVERSITY
 WESTERN STATE NORMAL SCHOOL
 WHEATON COLLEGE
 WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
 YALE UNIVERSITY

5. EVENING LECTURES, 1920

Friday, July 2,

DR. G. H. PARKER "Activities of Renilla."

Tuesday, July 6,

DR. C. R. STOCKARD "Structure and Type as Influenced
by Rate of Development and
Growth."

Friday, July 9,

DR. JACQUES LOEB "General Chemistry and Colloid
Chemistry of Proteins."

Tuesday, July 13,

DR. C. W. METZ "Studies on the Relationships of
Chromosomes in Different
Species of *Drosophila*."

Friday, July 16,

DR. R. M. YERKES "The Intelligence of Biologists."

Tuesday, July 20,

DR. CHARLES ZELENY "Some Factors Controlling Eye-
Facet Number in *Drosophila*."

Friday, July 23,

DR. CHRISTINE LADD-FRANKLIN . "Theories of Chromatic and
Achromatic Sensations."

Tuesday, July 27,

DR. HENRY LAURENS....."The Investigation of the Stimulating Effect of Visible Radiation in an Equal-Energy Spectrum."

Friday, July 30,

DR. RAYMOND PEARL....."Some Problems in Human Biology."

Tuesday, Aug. 3,

DR. LEO LOEB....."Transplantation and Individuality."

Friday, Aug. 6,

DR. WARREN H. LEWIS....."The Reactions of Cells in Tissue Cultures."

Tuesday, Aug. 10,

MR. W. LYMAN UNDERWOOD ... "Adventures in the Land of Sunshine."

VI. MEMBERS OF THE CORPORATION.

I. LIFE MEMBERS.

ALLIS, MR. E. P., JR., Palais Carnoles, Menton, France.

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MORGAN, MRS. T. H., New York City, N. Y.

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2. REGULAR MEMBERS, AUGUST, 1920.

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BECKWITH, MISS CORA J., Vassar College, Poughkeepsie, N. Y.
BEHRE, MISS ELINOR H., Louisiana State University, Baton Rouge, La.
BIGELOW, PROF. M. A., Teachers College, Columbia University, New York City.
BIGELOW, PROF. R. P., Mass. Institute of Technology, Cambridge, Mass.
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DEDERER, DR. PAULINE H., Connecticut College, New London,
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WOODWARD, DR. ALVALYN E., Amherst College, Amherst, Mass.

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YOUNG, PROF. ROBERT T., University of North Dakota, University, N. D.

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